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IS 9475 (1986): Plug and Ring Gauges for Self Release 7/24 Tapers [PGD 25: Engineering Metrology]

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Indian Standard

(Reaffirmed 2006)

SPECIFICATION FOR PLUG AND RING GAUGES FOR SELF RELEASE 7/24 TAPERS

(First Revision)

Engineering Metrology Sectional Committee, EDC 43; Gauges Subcommittee, EDC 43 : 3 [Ref : Doc : EDC 43 (4322)]

1. Scope — Covers, the requirements of plug and ring gauges used for verification of internal and external self release 7/24 tapers covered in IS : 2340-1972 'Dimensions for self release 7/24 tapers for milling arbors and tool shank (*first revision*)', and IS : 6681-1972 'Dimensions for self release 7/24 tapers for spindle noses for milling machines'.

1.1 Recommendations for use of gauges are given in Appendix A.

2. Material and Hardness

2.1 *Material* — The plug and ring gauges shall be made of suitable quality tool steel such as T215Cr12 and T105Cr1 Mn 60 as specified in IS : 7018 (Part 1)-1983' Technical supply condition for gauges: Part 1 General (*first revision*)'.

2.2 *Hardness* — The gauges shall be suitably heat treated for hardness and stabilized. The gauging surfaces shall have a hardness of 760 HV (*Min*) [Ref IS : 1501 (Part 1)-1984 Methods for Vickers hardness test for metallic materials: Part 1, HV 5 to HV 100 (*second revision*)].

3. Dimensions and Tolerances

3.1 *Plug Gauges* — As given in Table 1.

3.2 *Ring Gauges* — As given in Table 2.

3.3 Dimensional deviations for untoleranced dimensions shall be of medium class according to IS : 2102 (Part 1)-1980 'General tolerances for dimensions and form and position: Part 1 General tolerances for linear and angular dimensions (*second revision*)'.

4. Workmanship and Finish — Gauges shall be well finished and free from cracks, burrs, rust or other defects. The gauging surfaces shall be ground and lapped. The knurling shall be smooth and free from sharp corners and shall conform to IS : 3403-1981 'Dimensions for knurls (*first revision*)'.

5. Designation — Taper plug or taper ring gauges shall indicate:

a) Name of gauge,
b) Designation of taper, and
c) Number of this standard.

Examples :

a) Taper plug gauge of 7/24 taper number 40 shall be designated as:
    Taper Plug Gauge, 7/24 Taper 40, IS : 9475......

b) Taper ring gauge of 7/24 taper number 40 shall be designated as:
    Taper Ring Gauge, 7/24 Taper 40, IS : 9475......

6. Other Requirements — Requirements of gauges not covered in this standard shall conform to IS : 7018 (Part 1)-1983 'Technical supply conditions for gauges: Part 1 General (*first revision*)'.

7. Marking — Gauges shall be legibly and indelibly marked with the designation of the taper, manufacturer's name, initials or trade-mark (if any) and the year of manufacture.

7.1 It is recommended that gauges shall also be marked with serial number which facilitates identification when gauges are submitted to an inspection authority.

7.2 *Certification Marking* — Details available with Bureau of Indian Standards.

8. Protective Coating and Packing — The gauges shall be covered with a suitable rust proof coating and packed in non-absorbent paper. The gauges shall then be packed for safe handling. Each type and size of gauge shall be packed separately and the cover shall bear the type and size of gauge, manufacturer's name, initials and the year of manufacture.

Adopted 10 November 1986

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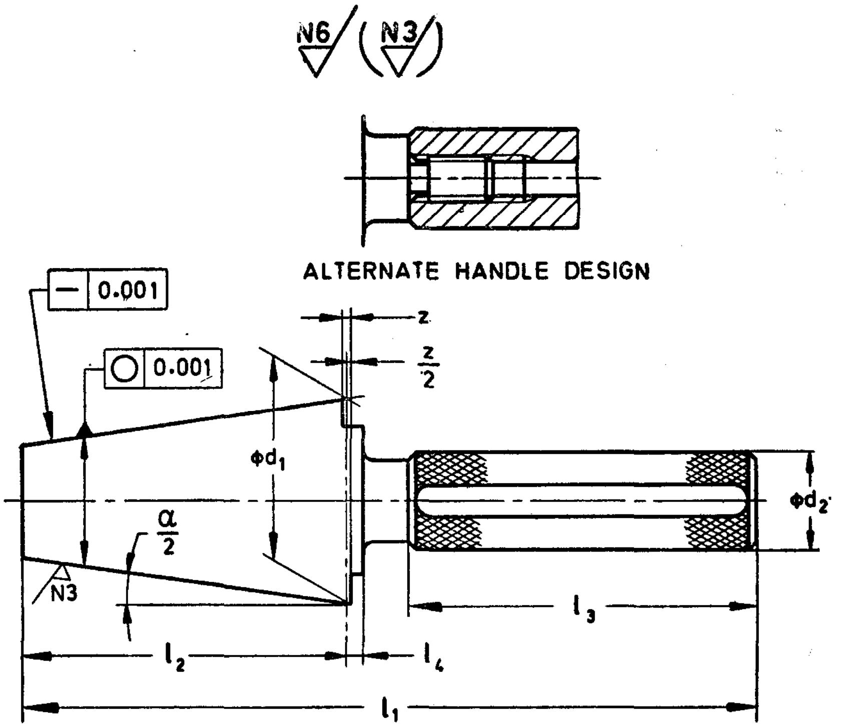
TABLE 1 DIMENSIONS FOR TAPER PLUG GAUGE

(*Clause* 3.1)

All dimensions in millimetres.



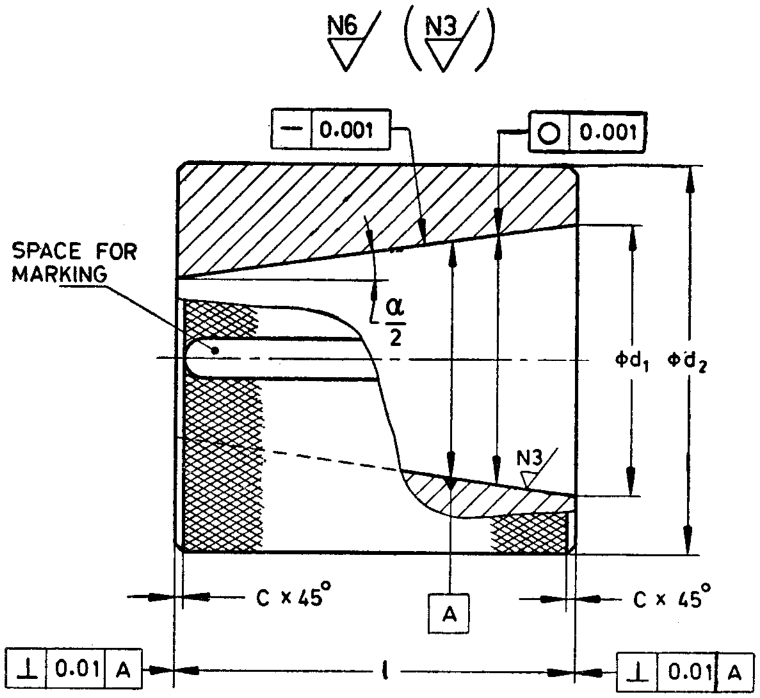
Designation of Taper	Dia d_1 js5	Dia d_2	l_1	l_2	l_3	l_4	z ± 0·05	$\alpha/2$	AT_D µm
30	31·75	25	150	49·2	90	3	0·8	8° 17′ 50″	+3·9
40	44·45	25	170	65·6	90	3	0·8	8° 17′ 50″	+4·2
45	57·15	25	190	84·8	90	3	0·8	8° 17′ 50″	+5·4
50	69·85	25	210	103·7	90	3	0·8	8° 17′ 50″	+5·2
55	88·90	25	235	132·0	90	3	0·8	8° 17′ 50″	+6·6
60	107·95	25	270	163·7	90	3	0·8	8° 17′ 50″	+6·4
65	133·35	36	336	200·1	110	3	0·8	8° 17′ 50″	+7·9
70	165·10	36	386	250·6	110	3	0·8	8° 17′ 50″	+8·0
75	203·20	36	442	305·8	110	3	0·8	8° 17′ 50″	+9·8
80	254·00	36	575	390·8	110	3	0·8	8° 17′ 50″	+12·5

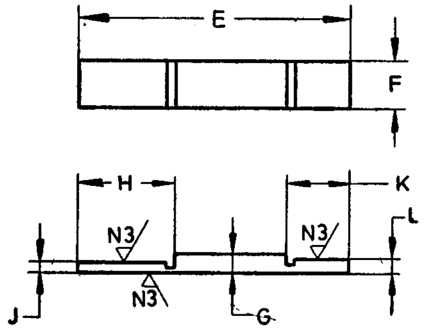
Note — Cone angle tolerance (AT_D), is AT4 grade as per IS : 7615-1975 'System of cone tolerances'.

TABLE 2 DIMENSIONS FOR TAPER RING GAUGE AND GAUGE PLATE

(*Clause* 3.2)

Dimensions in millimetres except otherwise indicated





GAUGE PLATE

Designation of Taper	Dia d_1 js5	Dia d_2	l	C	$\alpha/2$	AT$_D$ µm	E	F	G	H	J	K	L
30	31·75	60	49·2	1·6	8° 17′ 50″	−3·9	50	12	3	20	1·2	12	2·0
40	44·45	70	65·6	1·6	8° 17′ 50″	−4·2	50	12	3	20	1·2	12	2·0
45	57·15	85	84·8	1·6	8° 17′ 50″	−5·4	70	12	5	25	2·8	16	3·6
50	69·85	100	103·7	2·0	8° 17′ 50″	−5·2	70	12	5	25	2·8	16	3·6
55	88·90	120	132·0	2·0	8° 17′ 50″	−6·6	70	12	5	25	2·8	16	3·6
60	107·95	144	163·7	3·0	8° 17′ 50″	−6·4	70	12	5	25	2·8	16	3·6
65	133·35	170	200·1	4·0	8° 17′ 50″	−7·9	80	12	6	30	3·6	20	4·4
70	165·10	200	250·6	4·0	8° 17′ 50″	−8·0	80	12	6	30	3·6	20	4·4
75	203·20	245	305·8	5·0	8° 17′ 50″	−9·8	80	12	7	40	4·6	20	5·4
80	254·00	300	390·8	6·0	8° 17′ 50″	−12·5	80	12	8	50	5·6	20	6·4

Note — Cone angle tolerance (AT$_D$) is AT4 grade as per IS : 7615-1975 'System of cone tolerances'.

APPENDIX A

(*Clause* 1.1)

RECOMMENDATIONS FOR USE OF GAUGES

A-1. Recommendations for Use of Gauges shall be as given below:

A-1.1 *Taper Plug Gauge* — The internal taper shall be inspected by the help of taper plug gauge. The taper plug gauge shall be inserted as far as it goes with light pressure. At the extreme point, the face of the large end of the internal taper shall be within two steps provided on the taper plug gauge (*see* Fig. 1).

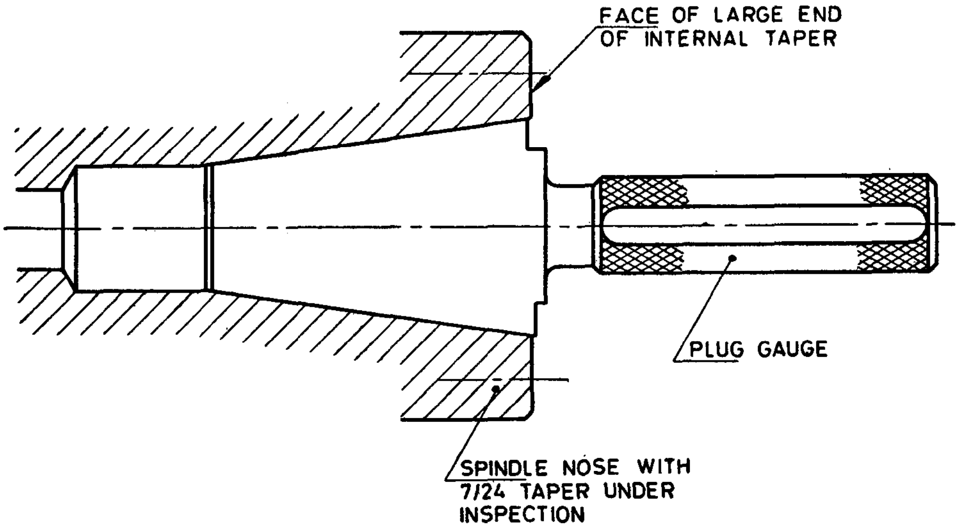

FACE OF LARGE END OF INTERNAL TAPER
PLUG GAUGE
SPINDLE NOSE WITH 7/24 TAPER UNDER INSPECTION

FIG. 1 RECOMMENDED USE OF TAPER PLUG GAUGE

A-1.2 *Taper Ring Gauge* — The external taper of a tool shank or milling arbor shall be inspected with a taper ring gauge. The taper ring gauge shall be inserted as far as it goes with light pressure. The face of the bigger end of gauge shall be at a distance of $y \pm z$ from the flange of the arbor/tool shank as per IS : 2340-1972 'Dimensions for self release 7/24 tapers for milling arbor and tool shank (*first revision*)', when checked by means of a plate gauge (*see* Fig. 2).

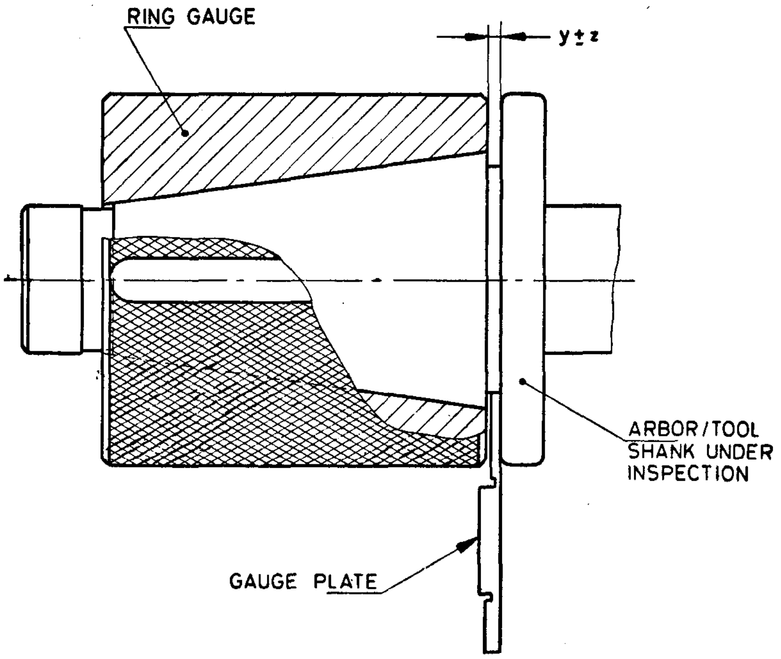


FIG. 2 RECOMMENDED USE OF TAPER RING GAUGE

EXPLANATORY NOTE

This standard was first published in 1980. This first revision has been brought out to bring it in line with the prevalent manufacturing practices in the country.

Following alterations have been made:

i) Recommendations for use of gauges have been added as Appendix A.

ii) Cone tolerances of gauges have been revised to fall in line with IS : 7615-1975 'System of cone tolerances'.

iii) The alternate handle design is also provided.

iv) GO NOGO steps have been introduced in place of ring mark.

In preparation of this standard assistance has been derived from BS : 1660-1972 'Machine tapers, reduction sleeves and extension sockets', issued by the British Standards Institution (BSI).

Printed at Delhi Printers, Delhi, India